THE

AIR BALLOON:

Or a TREATISE on

THE AEROSTATIC GLOBE,

Lately invented by

The celebrated Monſ. MONTGOLFIER of Paris.

SHEWING,

Firſt—Thoſe Properties of Air, which influence an Air Balloon.

2dly—The particular Conſtruction and Methods of filling it.

3dly—Some of the great Variety of probable Uſes which this important Diſcovery may be applied to for the Benefit of Mankind.

The Whole rendered familiar to the plaineſt Capacity.

A NEW EDITION, CORRECTED.

" To be impriſoned in the viewleſs-winds,
" And blown with reſtleſs violence round about
" The pendent world."

SHAKESPEARE's Meaſure for Meaſure.

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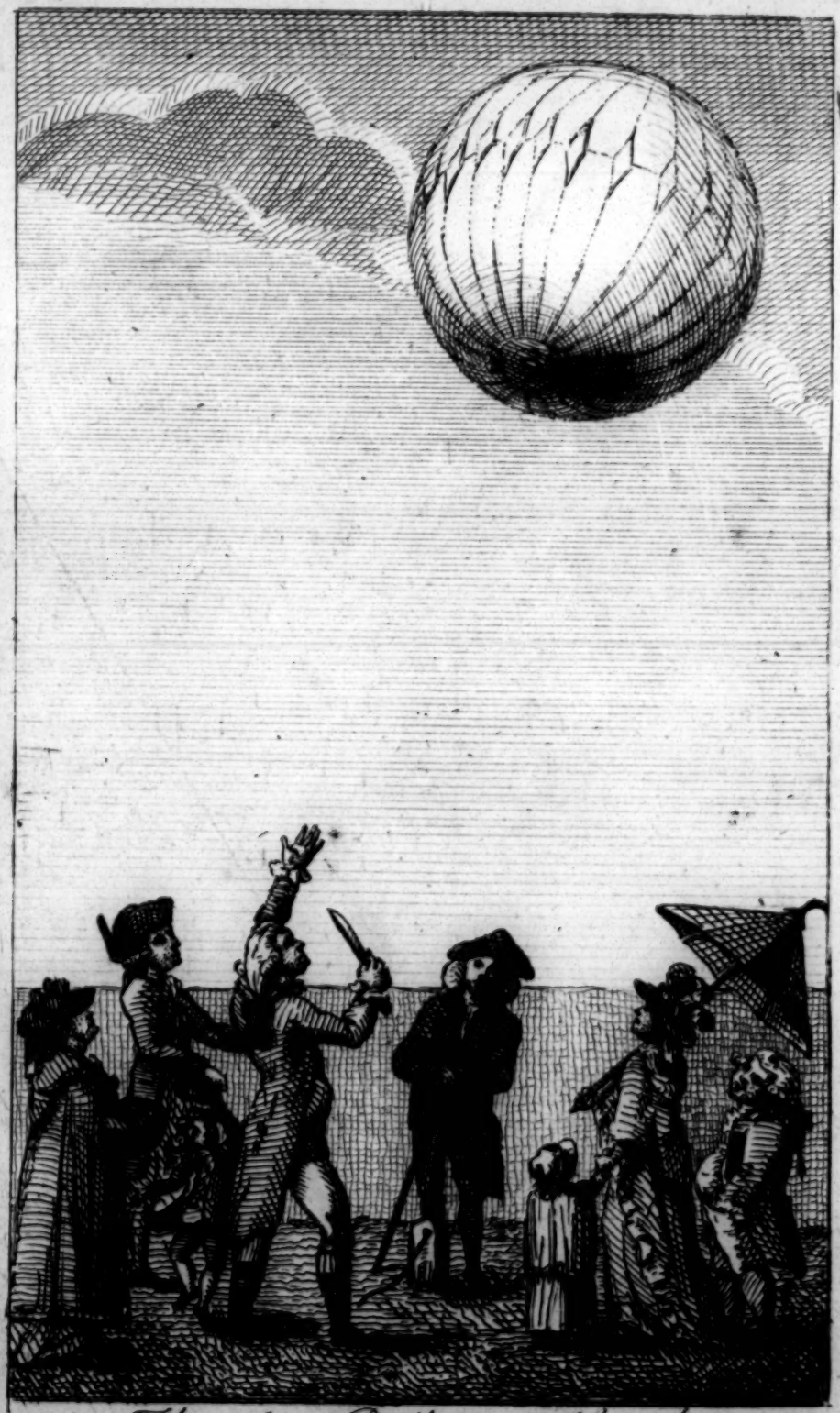

The Air Balloon Afcending.

THE UNIVERSALITY OF BALLOONS.

To the Editor of the Univerſal Magazine.

Sir,

BALLOONS have, during laſt autumn, abſolutely eclipſed the wonted glory of paper-kites in England; nor has the curioſity, in regard to them, been confined to England ſolely. While M. Garnerin was giving us, in this country, a ſpecimen of the improvements in the aeronautic arts by the French revolution, there ſtarted a new aeronautic in France, to gratify the paſſion of his countrymen for exploring the caſtles in the air, and aſcending to the halls of the clouds. A Mr. Czerny roſe in a balloon to amuſe the curioſity of the emperor of Ruſſia and the inhabitants of St. Peterſburgh. And there is, in truth, ſcarce a country in Europe in which one attempt or another has not been of late made to invade the province of the winged tribes, to ſoar with the eagle, or with the 'poiſed lark,' to ſwim in air.

Now at this paſſion for balloon-flights, and balloon-expeditions, ſome perſons are pleaſed to expreſs great ſurprize. But, in my mind, nothing in the world can be more natural.

What is man himſelf, but a balloon? His body ſo ſlight, ſo flexible, ſo eaſily hurt and torn—what is it, but a covering of gummed taffety? His mind, big with varieties, with reſentments, with hopes, with fears, ready to fly off whenever any fracture is made in its covering, catching fire to danger of deſtruction, by one paſſion or another.—Surely this may well be regarded as nothing elſe but a little inflammable gas.

Moſt of the undertakings of man are merely flights of a balloon. What is education, but merely the act of blowing up the balloon, and fitting it for a flight? It often miſgives, even when it is conducted with the greateſt pains, and the moſt laborious oſtentation of theoretic ſkill. Preciſely thus did honeſt Mr. Farret, at Margate, at Greenwich, and at Swanſea, fail in all his efforts to riſe freely and boldly into the air.

What are the lover's anxieties, but the ſolicitudes of a man who deſires to inflate his balloon, and to fix himſelf to its tail in a car, in which he may riſe and deſcend with it?

The hero who murders, burns, and ravages, to gain a name, has, as the poet well expreſſes it, no other object than '*virûm volitare per ora*—to fly over men's heads, and before their faces.' And this is, undeniably, nothing elſe than to make a balloon, and mount aloft in it. The military hero's balloon-enterprize, is indeed the moſt dangerous, and the leaſt praiſeworthy of all. His is, in fact, one of thoſe fire-balloons againſt which M. Garnerin ſo kindly warned the good people of London by advertiſement.

Oratory is nothing but the art of making balloons. The orator's profeſſed objects are, 'to ſwell, to inflame, to elevate.' But theſe are the very acts properly belonging to the mechanician of balloons. He employs only words, which we all know to be but wind, breath, or air; and ſuch alſo is the matter employed by the maker of balloons. The orator's eloquence is univerſally confeſſed to be the greateſt, when it is pure inflammable matter, that is air, or as Mr. Gray ſays, 'thoughts that breathe, and words that burn.' And it is only pure inflammable gas, that will beſt ſerve the purpoſes of the balloon-maker.

Thus, ſir, it might be ſhown, by a ſurvey of all the departments of life, that nothing is ſo univerſal as balloons, and projects of balloon-flying: that, hence, there can be nothing more natural than the curioſity about balloons, which ſome men have lately preſumed to find fault with.

Yours, &c.

NUGACULUS.

THE AIR BALLOON.

IT has been amongſt the complaints of the preſent times, that whilſt we are travelling the road of Moral Philoſophy with ſome expedition, Natural Philoſophy has not alike been the object of our purſuit. And indeed, if we obſerve the ſpirit of toleration, which has of late been ſpreading itſelf thro' thoſe countries, where fanaticiſm and bigotry ſeemed to have taken up their eternal reſidence, and compare it with the falling off which has taken place of late years in the Philoſophical Tranſactions of Great Britain, this complaint will be found to have ſome claim. Whether this may be attributed to the ſuperior wiſdom of the preſent times, which is chiefly engaged about what "more immediately comes home to mens "boſoms" and occaſions, is not ſo eaſily determined. The preſent year, however,

has furniſhed us with an experimental improvement in Natural Philoſophy, which fully atones for her late repoſe, and which, if carried to the various uſes which probability will warrant us to expect, may prove one of the moſt novel and ſerviceable diſcoveries that this century has produced.

What is here alluded to is *Monſ. Montgolfier*'s late invention of the *Aeroſtatic Globe*, or *Air Balloon* — an experiment, which in a very few ages back would have filled the world with amazement and wonder, and perhaps have ſent the inventor to his grave with ignominy and diſgrace. The times, however, in this reſpect, are more enlightened; for whilſt this phænomenon produces novelty, and opens a wide field for ſpeculation and improvement—it gives due honours and rewards to the Philoſopher.

But ſuch is the ſtate of Natural Philoſophy, that, except in a very few inſtances, all diſcoveries and experiments

not only lie amongſt the learned, but the publications of thoſe diſcoveries are for the moſt part written in ſuch a technical ſtyle, and preſuppoſe ſo much ſcientific knowledge, that the generality of the world cannot readily comprehend them. By this I do not mean to ſay, that all ſciences are not perhaps better explained by terms adapted to that particular ſcience, provided the whole of the public were equally learned. But as this never can be the caſe—in all great and important diſcoveries, which may in ſome reſpect meet the ſpeculation as well as the general benefit of mankind—treatiſes adapted to ſuch capacities may have their uſe, by rouſing the attention of ſtrong, but unlettered minds, to add new diſcoveries out of the catalogue of more ſcientific reſearches — as it was a *paper maker* in Paris ‡ that firſt ſent this *Air Balloon* above our atmoſphere, who knows

‡ Monſ. Montgolfier.

but

but it might be reſerved for an Engliſh miller, or wheel-wright, to add wings, or ſome aerial rudder to guide it through thoſe regions with certainty and preciſion?

It is upon this principle I offer this little treatiſe to the Public, not attempting to explain any thing to the learned, who, from their particular ſtudies and experiments in this branch of knowledge, muſt know much more of the ſubject—but to ſatisfy the wiſhes of unlettered curioſity, by explaining, firſt, thoſe general properties of air, which influence an *Air Balloon*—ſecond, how an *Air Balloon* is conſtructed, and the methods of filling it—together with ſome of the probable uſes which ſuch a diſcovery might ultimately lead to for the benefit of mankind.

Air, in Philoſophy, ſignifies that thin and compreſſible body in which we breathe, and which ſurrounds the earth to a great height. The air is ſcarce to be perceived by ourſelves, but it ſufficiently diſcovers itſelf by the reſiſtance it makes

to

to bodies moving in it, and by its ſtrong motion againſt other bodies, which is called *wind*. The laws of our exiſtence and inevitable neceſſity oblige us to take in, and return this air, be it what it will; inſomuch, that all the aſſiſtances of art are vain, and all that is done for us in the common courſe of nature fruitleſs, if we are deprived of its benefits. Nor is this peculiar to man or animals alone; it is the grand and neceſſary inſtrument which Nature univerſally employs in almoſt all the operations ſhe is perpetually engaged in. There is ſcarcely any liquid, as appears by experiments, which has not air intermixed with it, or ſcarcely any ſolid out of which it may not be extracted.

But in order to obtain a more particular knowledge of air, it will be neceſſary to conſider diſtinctly ſome of its eſſential properties. The firſt, therefore, that offers itſelf to our conſideration is *fluidity*. This is ſo natural to it, that all the va-

rious

rious experiments which have been made, ſhew it cannot be deprived of it. Indeed, common obſervation, independent of chemical experiments, will fully prove this: for, in the ſharpeſt froſt, where every thing is congealed, the air alone remains *fluid*; nay, even in an artificial cold, forty degrees greater than ever nature has been obſerved to produce, the air ſtill retains its *fluidity*, notwithſtanding it is acted upon by ſuch a prodigious exceſs of Cold.

If you likewiſe compreſs the air with ever ſo great weight and force into the utmoſt denſity or compactneſs, yet it then does not become ſolid by concretion, or union of its ſeveral particles, but remains equally *fluid* as before, and as ſoon as ever the compreſſion is removed, it reſumes its former degree of liquidity. In the mean time it muſt be remembered, that the air concretes together, and unites with every ſpecies of known bodies, and ſerves as a kind of element in their compoſition.

poſition. This is ſufficiently evident from the large quantity of air, which, of its own accord, makes its way out of almoſt every body, whilſt it is analizing or reducing into its principles; and this is now uſually (though perhaps not altogether properly) called factitious or made air. The fact upon examination appears to be thus: air is contained in all known liquors whatſoever, it penetrates together with them into the receſſes of compound bodies; thus, at laſt, after a coalition of the whole, it remains locked up in the pores of thoſe bodies, as it were, in very minute veſſels, and afterwards the liquor, into which it was conveyed thither, being diſſipated, it is left there alone—Hence then it is evident, that this air was not concreted there, but only lay concealed, being retained by the including body. As ſoon as ever therefore it can diſengage itſelf from this confinement, it ruſhes out, not in the leaſt changed, and returns with velocity to its proper nature.

The ſecond property of air is that of *weight*, or *gravity*, which from numberleſs experiments (and particularly the following) is found to gravitate upon all inferior bodies.

Take a glaſs tube hermetically or chymically ſealed, fill it with raw mercury, and invert it, immerging the open end of a tube in a baſon or other veſſel filled with the ſame fluid, ſo that the cloſed end may be perpendicular to the ſurface of the mercury in the baſon. The tube being thus ſituated, the mercury will run out at the open end of the tube into the baſon; till it is about twenty-eight inches above the ſurface of the fluid contained therein; at which height, notwithſtanding the great ſpecific gravity of the mercury, it will remain ſuſpended in the tube. Now, it is certain, that nothing can ſuſtain the weight of the mercury in the tube, but an external preſſure on the ſurface of the fluid, and this can can be no other than the weight of the incum-

incumbent atmoſphere, which, not being counterbalanced by the air in the tube, raiſes, or ſuſpends when raiſed, a quantity of mercury, whoſe weight is equal to that of a column of air of the ſame diameter of the tube, in order to maintain an equilibrium.

And this appears evident from hence, that if you open the upper end of the tube, which before was cloſed up, the air by preſſing on the mercury in the tube with the ſame force as it does on the mercury without it, the former will ſubſide to the level of the latter. This is what is called "The *Torricellian* ex-"periment," from the Italian philoſopher *Torricellius* its inventor.—And on this principle depend the ſtructure and uſe of the barometer.

The weight of air is continually changing in proportion to the different degrees of heat and cold—but the weight of the common air, near the ſurface of the earth, at the time of the middle weight

of the atmoſphere, and in the moſt temperate ſeaſon of the year, is to that of water, as 1 to 850.

The third property of air is *elaſticity*. This is that ſingular quality by which all known air, poſſeſſing a certain ſpace, and being confined there ſo that it cannot eſcape, will, if it be preſſed with a determined weight, reduce itſelf into a leſs ſpace, which will be always in a reciprocal proportion to the quantity of the weight which it acts upon; with this circumſtance, however, that it will conſtantly, by a ſpontaneous expanſion, recover again the ſpace it had loſt, in proportion as the compreſſive force is diminiſhed. This property ſeems peculiar to AIR, there being no other *elaſtic* fluid in nature yet diſcovered.

The elaſticity of the air cannot be deſtroyed: for, upon examination, by every kind of experiment, it has always remained the ſame; nor are its principles either by long reſt, or the greateſt preſ-

ſure,

ſure, ever ſo altered as to loſe their *elaſticity*. The celebrated Mr. Boyle and Mariotte having, with a particular view to this, kept common air ſtrongly compreſſed and confined in a wind gun, found upon ſetting it at liberty, that it was perfectly as *elaſtic* as before; and Robervallius examining air, which had been confined in the ſame manner fifteen years, found that it had not loſt any of its *elaſticity*.

Mr. Boyle has likewiſe proved, that the *elaſtic* power, which prevails in any particular portion of the air, without any greater condenſation than what is owing to the compreſſing air itſelf, can ſuſtain all the force of a whole column of the incumbent atmoſphere; and alſo that this *elaſtic* power, in ſuch a very ſmall portion of air, can, by expanding itſelf, repel the bodies which compreſs it, with as much force as that which is exerted by the whole external body of the air.

A very

A very ſmall portion of air, therefore, wherever confined, is capable of producing the very ſame effects as a very large quantity in another place; for if any portion of common air is contained in a cavity that is eaſily compreſſible, it will then ſuſtain the whole preſſure, and entirely repel the whole body of the atmoſphere. And whenever the air contained in that place is heated by fire, or freed from its external preſſure, it immediately, by expanding itſelf, becomes ſo rare, as to produce effects equal to thoſe of the greateſt body of air.

Another law of the *elaſticity* of air is, that when it is condenſed to a certain degree, it acquires by the application of heat a greater power to expand itſelf than it had before; and this power of rarefaction ariſing from heat, has the ſame effect, as if that air had been rendered denſer, in proportion to the degree of heat which it before obtained. Unequal

maſſes

maſſes of air, but of the ſame denſity, are always equally expanded by the ſame degree of fire; ſo that theſe expanſions in the ſame degree of denſity, by a conſtant law of Nature, are always in proportion to the augmentation of heat applied.—Hence, if the expanſion of air of a given denſity by a certain degree of heat is once diſcovered, it will conſtantly hold good in all ſimilar caſes.

But with regard to the *great elaſticity* of the air, this is likewiſe conſtantly obſerved, that the more it is condenſed by preſſure, the greater elaſtic force it will acquire by the ſame degree of heat, and that nearly in a direct ratio of the denſities. Hence it follows, that a portion of air that is exceeding denſe may, by means of a very ſmall degree of heat, acquire the greateſt reſiſting force. Alſo, if you increaſe the denſity of the air, and at the ſame time augment the heat applied to it, the elaſtic power of the air will always be increaſed in a compound ratio

ratio of both. The laſt law that is diſcovered in the elaſticity of the air is, that it is contracted into a ſmaller compaſs by cold, as it is by an increaſe of weight. Hence its denſity is always increaſed in proportion to the intenſeneſs of the cold.

Having thus deſcribed the three leading properties of Air—we now come to explain how this Element is applied in the conſtruction of an *Air Balloon*.

From the nature of air we find, that any factitious air which is lighter than the atmoſphere aſcends.—We ſee this by that air which is produced by a fire, called *ſmoke*, which being ſpecifically lighter than the atmoſpheric air, is carried up the chimney, and only ſettles when it gets to that height which is equal to its own levity. This quality of air has been long underſtood, and various theories have been ſuggeſted to what purpoſes it may be applied. Though Monſ. *Montgolfier*, we believe, was the firſt Eu-

ropean

topean philoſopher who made it a *travelling convenience* for man, and gave to the world an experiment, which is likely to become as uſeful as it is at preſent curious.

The methods of making the air which fills this *Aeroſtatic Globe* is as follow;

Take a certain quantity of oil of vitriol, in the proportion of an ounce to a quart of water, and mix both with filings of iron: theſe produce a factitious air, ſuppoſed to be about ten times lighter than the atmoſphere. This air ſo made is by a tube conducted into the *Air Balloon* ſo as not to give it all the fullneſs of a common bladder, but rather looſe in ſome parts, and this keeps it the longer from burſting in its progreſs through the air. The form of the *Air Balloon* is orbicular, or round—it is generally made of taffeta, or thin ſilk, on account of its lightneſs, and gummed on the ſeams, the better to prevent the air from tranſpiring. When it is properly filled, it is cloſely tied at the end, and from this moment

it becomes ſo much a lighter body than the circumambient air, that it would immediately aſcend, if not reſtrained by a proportionate balance. When it is let off (which is done by cutting the ſtrings which reſtrain it) it riſes for ſome time perpendicular, and rather ſlowly; it then follows the direction of the wind in a progreſſive aſcent, till it reaches that region of air which is lighter than itſelf. This air repels it with that force, ſo as either to burſt it, or force out by degrees the factitious air; in either caſe it deſcends with rapidity to the earth.

From this method of uſing an *Air Balloon*, the Public will readily ſee, that the experiment can only gratify curioſity —as very little or no uſe can be made of it, there being no poſſibility of reſtraining its height, or preventing its rapid declenſion—in either caſe it muſt be fatal to any perſon to aſcend with it; as it may travel through regions of air too rarefied for human reſpiration, and fall with

with ſuch rapidity as to cruſh him to pieces.

To remedy this, the ſame ingenious inventor has adopted another method of filling his *Balloon* by which he has ſecured its aſcent and deſcent with more certainty and ſafety; which is, inſtead of oil of vitriol, water, and filings of iron, to make his air of that ſmoke which is produced by the burning of wet ſtraw, and by carrying a quantity of this fuel with him (in a little gallery conſtructed round the Balloon, for the purpoſe of feeding it) he can aſcend or deſcend at pleaſure.

The method of ſupplying this laſt *Balloon* with air is, by burning the ſtraw on a grate affixed to the bottom of it — the ſmoke of which is infuſed into the Balloon by a tube, to which there is a cock to let it out as occaſions may require.

Of this he has made ſeveral experiments in the preſence of many thouſand ſpectators in Paris; amongſt whom were

ſome of the firſt rank in life and letters. —But the greateſt experiment which has as yet been made, was that on the 19th of October laſt by the Sieur *Giroud de Villette* and Monſ. *Rozier*. The Balloon conſtructed for this purpoſe was ſixty feet long and forty broad, which being filled with air made by the ſmoke of wet ſtraw was capable of taking up theſe two enterprizing Philoſophers, together with the weight of the gallery attached to it, and ſeveral pounds weight of fuel.

They took the opportunity of a day when the wind blew acroſs the city of Paris, and aſcending at one ſide Port St. Jacques, croſſed over to the Fauxbourgh St. Martin, that is, by way of making it more familiar to an Engliſh ear, (ſuppoſing the experiment was made in London) as if they aſcended at St. George's Fields, and traverſing acroſs the city, came down in one of the fields near Iſlington.

The

The height they aſcended was made by a computation, which was taken as they paſſed over the church of St. Sulpice, and is ſaid to be 1650 feet, which is more than four times higher than St. Paul's. In this region (contrary to the received opinion of moſt philoſophers, that man could not live in ſuch rarefied air) they could breathe freely; and ſo ſupported were they by the enthuſiaſm of their enterprize, that they had reſolution enough to enjoy the birds eye proſpect of ſo ſtupendous a height, and clearly ſee Neuilly, St. Cloud, Seve, Iſſy, Ivri, Charenton, and Choiſy—Some of thoſe place 48 miles from the capitol. The gardens about Paris appeared to them like *bouquets*, and the people paſſing and re-paſſing (according to the ſtrong expreſſion of Monſ. Rozier) "*like ſo many* "*mites in a cheeſe.*"—No bad ſituation to humble the pride of man, and make him feel his individual littleneſs and inſignificancy in the great ſcale of Creation.

In

In reſpect to the weight an *Air Balloon* can carry, it muſt depend on the ſize. That conſtructed by Mr. Biaggini, and lately let off in the Artillery Ground, Moorfields, was ten feet diameter, and could have carried about ſixteen pounds*—ſo that by a computation of this kind, on a more enlarged ſcale, the exact weight can be readily aſcertained—that lately ſent up in Paris, which we have been juſt deſcribing, was ſixty feet long, and forty broad—and muſt have carried up (computing the weight of the two men, the gallery, and ſtraw) not leſs than between three and four hundred weight.

In reſpect to its rate of travelling in the air, we may very well ſuppoſe it at leaſt fifteen miles an hour from the average calculation of experiments which

* Mr. Biaggini has juſt now prepared another *Air Balloon*, which he is exhibiting at the Pantheon, and which he ſhortly intends to let off in the Artillery Ground, 16 feet diameter, and of force ſufficient to carry up a child of eight years old.

have

have been made, without allowing for the loſs of time in the perpendicular aſcent, and the obſtructions it is ſubject to meet with from the ſhiftings of the wind; and if in any future diſcovery we ſhould be able to direct its courſe, there is no doubt it will travel with ſtill more velocity.

Such is a brief and plain deſcription of an *Air Balloon*, which has with ſo much juſtice rouſed the curioſity and attention of all Europe—a diſcovery, we muſt confeſs, hitherto merely curious, but which bids fair, from the probable improvements which may be made in it, to be highly ſerviceable to ſociety.

At preſent however, by this invention, we can only aſcend and deſcend, and the latter, perhaps, not always with the moſt perfect ſecurity: it is beſides at the mercy of the wind, "*to be blown with reſtleſs* "*violence round about this pendent world.*" The firſt object of improvement therefore will

will be to direct its motion in the air by the means of *wings*, or *feathered oars*. This may appear visionary to some; but we have authority to assure the Public, that not only the original inventor of the *Air Balloon* is busied in this project, but something of a similar nature is now in great forwardness amongst ourselves, under the direction of a Scotch artist, who is already supported by a subscription of seven hundred guineas to complete it.

The machine is to be in the form of a bird; the body is to contain the inflammable air; the shaft of the wings to be nine feet long, and nine inches wide; both to be made of the purest elastic steel ever wrought in this country, and the whole is to be worked and directed by a person who is to go up in a basket attached to the machine.

This once obtained, the uses which might arise from it are many and various.

On the first report of a country being invaded, an *Air Balloon* would save the expences

expences of meſſengers, poſts, &c. from the coaſts to the main army, as at the height it aſcends, with the aſſiſtance of glaſſes, the number of the enemy, together with their place of landing, might be communicated with great diſpatch.

A general likewiſe in the day of battle would derive ſingular advantage by going up in one of theſe machines; he would have a bird's eye view not only of every thing that was doing in his own, but the enemy's army, and by ſending down his orders occaſionally (which may be done by the means of a plummet) he may literally be ſaid

'*To ride in the whirlwind, and direct the ſtorm.*'

Obſervations at Sea may likewiſe be made at a greater diſtance, and with a greater certainty than at preſent, which would not only be uſeful in time of war, and preventive of accidents at all times, but add perhaps extenſive diſcoveries to our terreſtrial globe.

During ſieges they may be rendered particularly uſeful, by obſerving the works of the enemy, and of courſe rendering them ineffectual. Had this diſcovery been known even ſo late as the ſiege of Gibraltar, it would have ſaved that brave garriſon ſome lives, and great labour, as occaſional turrets were obliged to be built the better to obſerve the operations of the enemy—all which an *Air Balloon* would have ſaved. In caſes of fires in capitals or large towns, an *Air Ballloon* let off would inſtantly aſcertain where the fire was, and of courſe occaſion a more direct and ſpeedy aſſiſtance.

To maintain a war of poſts, as was pretty much the caſe in the late war in America, an *Air Balloon* would be of the moſt ſingular advantage. For inſtance, had the troops in that unfortunate expedition to Albany been provided with this celebrated diſcovery, to give neceſſary ſignals and intelligence to the detachment who were to ſupport them; the effects

of

of that unfortunate day would not be recorded, as they now are, in the debilitated and humiliating ſtate of Great Britain.

In Natural Philoſophy it bids fair to make many great and conſiderable improvements. It is well known, that our great philoſopher Dr. Franklyn, by means of an artificial Kite, has already drawn down lightning from the clouds: Why may not this experiment be improved by means of an *Air Balloon?* When the appearance and approach of clouds prognoſticate immediate thunder, an *Air Balloon* carrying up conductors might draw it down, and ſeparate that force, which oft has proved fatal to the lives of many. In the Weſt and Eaſt Indies, where thunder ſtorms are infinitely more frequent and miſchievous than in theſe countries, it would be a diſcovery of the moſt ſalutary kind, and as its objects would be of ſuch material advantage to the natives, there is little doubt but ſuch fur-

ther improvements may be made, as the very bad effects of thunder may in a great meaſure be prevented.

Phyſics may keep equal pace with the other improvements in Natural Philoſophy: for as the great organs of our ſenſes, taſting, feeling, hearing, and ſmelling, are communicated to us thro' the medium of the air, who can ſay what improvements the conſtitution might receive from ſuch quick and elevated changes? We all know, that ſome invalids are only kept alive by what phyſicians call the *change of air*, that is, by travelling from one country or town to another—but as the air is always allowed to be purer in its *aſcent*, and as an *Air Balloon* can regulate that aſcent to preciſion, the benefits may be of the moſt valuable kind. In *aſthmas* and *decays* it may turn out a ſpecific, and in other diſeaſes, though not ſo powerful, yet highly ſerviceable.

In ſhort, as the various properties of air are at preſent ſo well known to contribute to the preſervation of our exiſtence,

ence, what are we not led to hope from a knowledge of uſing it, and living in it in a purer and more extenſive degree than ever? The preſent period ſeems to be a favourable omen for the extenſion and encouragement of this diſcovery—as PEACE, the parent and patron of all knowledge, has happily once more reviſited Europe, and calls upon its philoſophers and artiſts to eraſe the ravages of war, by the cultivation of uſeful and ornamental ſcience.

POSTSCRIPT.

SINCE writing the above, the Editor is favoured with a letter from a reſpectable correſpondent in Paris, dated the 3d of December, acquainting him of a late experiment made of the *Air Balloon*, which he is happy in laying before the public, as it in a great meaſure juſtifies the ſanguine hopes he entertains of its further improvement.

" On

" On Monday the 1ſt of December an *Air Balloon*, under the direction of Meſſrs. Charles and Roberts, was let off from the Thuilleries. It had ſuſpended to it a baſket, covered with blue ſilk and paper finely gilt, in the ſhape of a triumphal car, in which Mr. Charles and Mr. Roberts embarked, and mounted up into the air, amidſt many thouſands of people of all ranks and conditions, perhaps three or four hundred thouſand. Beſide the Duke de Chartres and a great part of the French nobility, there were the Duke and Ducheſs of Cumberland, the Duke and Ducheſs of Mancheſter, and many other foreign princes and nobility. The philoſophers had flags with them of different colours, with which, as they mounted aloft, they ſaluted the admiring world below. When they came to the height at which they meant to ſail (which was computed to be about twice the height of St. Paul's) they threw down a flag as agreed. They then glided along a ſteady horizontal track over the Fauxbourg St. Honore, ſaluting the people as they went along, with their flags; and landed at about 20 miles diſtance from the place they ſet out from, being accom-

accompanied (*ſur la terre*) by the Duke de Chartres, and ſeveral of the French and Engliſh nobility and gentry, who came in almoſt at their landing. Mr. Roberts then got out, when Mr. Charles, after throwing out ſome ballaſt to lighten the machine, aſcended alone in the *Balloon* to the almoſt incredible height of 15026 toiſes, or 3052 yards perpendicular, in about ten minutes.

" The account Mr. Charles gives of his obſervations during this time (which is publiſhed in the Journal of to-day) is, that he loſt ſight of every thing below upon earth, and ſaw nothing but a wide expanſe of fine æther—that the Barometer fell from 28 to 18, and the Thermometer from 7 above freezing to 5 below it. He deſcended about four or five miles from the ſpot he got up, near the houſe of a Mr. Farrar, an Engliſh gentleman, where he ſlept that night, and was brought to town by a nobleman in his own carriage the next day, amidſt the general acclamations of the Public.

" The Balloon was compoſed of red and ſtraw-coloured taffeta, which were pieced alternately, ſo as to appear like meri-

meridional lines upon a terreſtrial globe. The upper hemiſphere was covered with a netting, ſurrounded at the bottom by a hoop, to which the car war was ſuſpended; ſo that the elaſtic preſſure of the inflammable air was equally repreſſed by all the meſhes of the net above. Monſ. Montgolfier attended during the whole of the experiment."

We are ſorry to add to this account, that on the arrival of Meſſ. Charles and Roberts in Paris, they were arreſted by order of the King, who, as *father of his people*, was adviſed by ſome bigotted Eccleſiaſtics to prevent the farther endangering the lives of his ſubjects.—But as great intereſt is making for them by the princes of the blood, together with all the philoſophers in Paris, it is thought they will ſpeedily be diſcharged. Public curioſity is much damped by this circumſtance, as the next experiment Mr. Charles meant to make of the *Air Balloon* was to take a trip in it from Calais to Dover, in which he was to be accompanied by the celebrated Monſ. *Bougainville*.

THE END.